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SELECTED LABOR REQUIREMENTS AND COSTS OF TWO ICE CREAM DELIVERY SYSTEMS

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SELECTED LABOR REQUIREMENTS AND COSTS OF TWO ICE CREAM DELIVERY SYSTEMS

By Robert C. Mongelli 1/

ABSTRACT

A study of the two major distribution systems (call-in and driver-salesman) of ice cream from producer to retailer was made.

The objectives of the study were to compare labor requirements and costs for the two systems and discuss advantages and disadvantages of the systems.

Comparable labor costs of the two systems for delivery of 300 packages for a 15-stop delivery trip were $23.94 or 7.98 cents per package for the call-in system and $37.20 or 12.40 cents per package for the driver-salesman system. In a 300-package truckload, labor savings from the call-in system would be $13.26. These costs represent the labor requirements to determine the total order for the delivery trip and to unload ice cream products at the retail outlets. Labor costs to assemble the order in the freezer, load the truck, and transport are not included in the comparison because these costs represent functions that were the same for each system.

In a 15-stop delivery trip, the driver-salesman spent a total of 2.28 man-hours more at the delivery stops than the call-in system driver. Also, in 13 percent of the stops the driver-salesman had "no sales"; at these stops, he used 0.31 man-hour going into a store to determine needs. Under the call-in system, this time could have been used for other revenue-producing activities.

Each delivery system has advantages and disadvantages. The advantages of the driver-salesman delivery system are: (1) Company employee is not required to make or receive telephone calls in order to write customers' orders, (2) retailer will not have to be trained to determine orders or have to spend time rotating merchandise, (3) the driver can carry additional items that he thinks the retailer may request at time of delivery, and (4) the driver may be able to sell more ice cream per stop.

The advantages of the call-in delivery system are: (1) Better quality control is maintained because the product is handled less, (2) the driver has an order sheet for each customer and does not have to spend time at each stop determining needs, (3) driver does not have to drive to a retailer and then find out there will be a "no sale," (4) driver does not have to spend time determining and writing customer orders for the next-day delivery, (5) since the call-in driver spends less time at each stop than the driver-salesman, the

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call-in driver can service approximately five more stops in an 8-hour workday, and (6) delivery is more accurate, since the correct amount of product is delivered to the right customer. The customer's order is checked at the plant and again at the retail outlet.

INTRODUCTION

In a study 2/ conducted by the Agricultural Research Service, five ice cream delivery companies were studied and evaluated for labor productivity, truck door openings, and product temperature during delivery. Results from the study showed ice cream companies how they could improve many aspects of their delivery operations. But, labor costs for distribution of ice cream, like all other costs, keep rising. Ice cream companies are always looking for ways to reduce these delivery costs. Local delivery of ice cream is based on two major systems: the telephone call-in and the driver-salesman systems.

The distribution of ice cream from plant to retail outlet is composed of five functions. These functions are:

(1) Determining the total truck order for a delivery route, either by telephoning retail outlets on the route or by a driver deciding what is needed.

(2) Assembling the order in the freezer.

(3) Loading the delivery truck.

(4) Transporting to the retail outlets.

(5) Unloading at the retail outlets. Call-in driver can just unload from his order sheet. But, a driver-salesman must first determine customer's needs and then unload the order from the truck.

The purpose of this report is to investigate and determine the labor costs associated with each delivery system. In order to do this, labor costs are developed and discussed for functions (1) and (5). Labor costs for the other three functions are the same in both systems.

Discussion of the advantages and disadvantages of the two systems is also included.

METHODOLOGY

This study was conducted at an ice cream company that uses both the call-in and driver-salesman systems for the local delivery of ice cream. Approximately

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2/ Mongelli, R. C., and Lundquist, A. L. An Evaluation of Five Ice Cream Delivery Systems. U.S. Dept. Agr., Agr. Res. Serv., ARS-NE-41, 23 pp. 1974.

six delivery trips were studied for each system. With each system, the researcher observed and recorded the method used and time required in hundredths of minutes to determine and write up order sheets at the plant and to unload ice cream products at the retail outlets. All activities in a normal workday from employees' arrival in the morning to departure in the evening were observed.

The variety of the product items handled by drivers in each system was about the same. Therefore, drivers using one system did not have to spend more time at their trucks looking for many more types of products than drivers using the other system.

In order to determine the labor costs for the two systems, the following assumptions were made to reduce the number of variables.

(1) Truck load is 300 packages. A package is defined as the basic unit delivered to the retail outlet. For example, this basic unit could be a package of 3 half-gallons wrapped together or a 10-count package of novelties.

(2) Delivery trip is 15 stops.

(3) Truck is six-door model.

(4) Package weight is approximately 4 or 5 pounds.

(5) Two-wheel handtruck is used to transport product from the truck into the store.

(6) Round trip distance between truck and store is 150 feet.

DESCRIPTION OF SYSTEMS

A description of the two systems is given below. The description includes how the store orders are determined and the techniques used by the drivers during the delivery of the product to the customer.

Call-in Delivery System

Two company employees call customers to determine their needs. The calls are made the day before the next scheduled delivery to the customer. About 2 percent of the customers have to be called twice because they had not determined their needs at the time of the first call. After the telephoning, load sheets are prepared for all stops on each delivery route. Then the loading crew foreman picks up the sheets, goes to the freezer, and begins consolidating the ice cream orders for each route with the help of one or two employees (fig. 1).

Ice cream items are not consolidated by delivery stop, but by the total amount of an item needed for the entire route. For example, five different customers may need a total of seven 3-gallon cans of vanilla ice cream. The

Figure 1.--Plant employee assembling a load order in the freezer.

order assembly crew will load the seven cans together as one particular item and not separate items by delivery stops.

After the ice cream is loaded on four-wheel handcarts, it remains in the freezer until the driver is ready to load his truck. Then the carts are transported from the freezer as they are needed, and the driver verifies the total count, transports the ice cream to his truck, and begins loading (fig. 2). Different ice cream items are loaded in particular compartments of the truck. In this way the driver, while consolidating his order for retail delivery, will know the items located in each compartment. This loading technique reduces the driver's searching time and the door openings. After loading is completed, the truck is driven to an overnight holding area, and the electrical power cord of the truck's refrigeration system is plugged in until the driver arrives the next morning.

Before the start of the delivery trip, the driver goes over his delivery route sheet and determines his sequence of stops.

At each delivery stop, the driver, standing at street level, opens one truck door at a time and reaches in to remove ice cream items as called for on the order for that stop. He usually has to open several doors, sometimes all six, to fill an order. Since each compartment in the truck usually contains

Figure 2.--Driver loading his delivery truck.

several different ice cream items and since the driver selects items in the sequence shown on the order sheet, it is usually necessary for him to reopen a door to find a particular item.

As the driver removes ice cream from the truck, he places it on a two-wheel handtruck. When the handtruck is loaded, the driver pushes it into the store and positions it next to the display case. After a store employee verifies the count, the driver straightens items in the display case and then places the order in the case (fig. 3). At some stops, the store manager may not require the driver to place the ice cream in the case, but only place it on the floor by the case.

Driver-Salesman Delivery System

When the driver returns from a day's delivery, he determines his ice cream needs for his next-day trip. After he prepares his load order, it is given to a member of the assembly crew and the order is assembled in the freezer. The driver pushes the carts from the freezer as they are needed and checks them by piece count and item description. He then transports the cart to the loading area and begins loading his truck. Again, certain items are loaded into certain compartments for easy order assembly at the retail outlet. He does not remove a second loaded cart from the freezer until he has emptied the previous cart.

After the loading is done, the truck is driven to the overnight parking area and the truck's refrigeration system is plugged into an electrical outlet for the overnight holding period.

The driver usually arrives at the plant the next morning between 6:00 a.m. and 7:00 a.m. to check the truck before beginning the delivery trip.

Figure 3.--Driver loading a display case in a retail store.

At each delivery stop, the driver first restacks the disarrayed items already in the store's display case. He then determines what items are needed and writes up the order (fig. 4). After returning to the truck, he removes needed ice cream packages (fig. 5), stacks them on his handtruck (fig. 6), wheels it into the store, has a store employee verify the count, and places the packages in the display case.

Figure 4.--Driver determining and writing up a store's order.

Figure 5.--Driver removing ice cream packages from truck compartment.

Figure 6.--Driver stacking ice cream packages on his handtruck.

RESULTS

This section discusses the differences and similarities of the two delivery systems and their labor requirements and costs.

At the Plant

With the call-in system, an employee is needed to make and receive telephone calls to fill orders. With the driver-salesman system, the driver estimates what is needed and writes up the order sheet.

Table 1 shows the labor costs for determining the total truck order and for writing up the order. Total labor cost per package was 1.20 cents for the call-in system and 1.06 cents for the driver-salesman system. An additional cost for the call-in system would be that of the telephone calls. This cost is not determined in the study.

Order assembly in the freezer, truck loading, and transportation to the retail outlets were assumed to be the same for both systems.

Table 1.--Labor time and cost to determine and write up order at the plant, for 2 delivery systems 1/

Plant activity	Call-in system	Driver-salesman system
Determine total truck order, write order sheet:		
Time (man-hours)	1.03	0.53
Cost (dollars)	2/3.60	3/3.18
Cost per package (dollars)	.0120	.0106

1/ Based on 15-stop trip and 300-package truckload.
2/ Based on $3.50 per hour for company employee.
3/ Based on $6.00 per hour for driver.

At the Delivery Stop

With the driver-salesman system, the driver must first go into the store to determine what is needed. In the store, the driver straightens packages in the display case, determines what items are needed, writes the order, and then returns to the truck to fill the order. With the call-in system, the driver stays at the truck and begins filling the order as called for on the order sheet.

Table 2 shows the labor cost for both systems at the delivery stop. With the call-in system the driver spent a total time of 3.39 man-hours at the 15 stops. This amounts to a labor cost of $20.34 or 6.78 cents per package. The driver-salesman spent a total time of 5.67 man-hours at the 15 stops. This amounts to $34.02 or 11.34 cents per package. The increased time and cost come from the driver-salesman having to determine the need at each stop.

Table 2.--Labor time and cost for specified activities at the delivery stops, for 2 delivery systems 1/

Delivery stop activity	Call-in system	Driver-salesman system
Walk from truck to display case, straighten case, determine needs, write order, return to truck:		
Time (man-hours)	--	2.39
Cost (dollars)	--	14.34
Fill order at truck:		
Time (man-hours)	1.36	2/1.42
Cost (dollars)	8.16	8.52
Walk from truck to store, check order in, put order away, return to truck:		
Time (man-hours)	3/2.03	1.86
Cost (dollars)	12.18	11.16
Total:		
Time (man-hours)	3.39	5.67
Cost (dollars)	20.34	34.02
Cost per package (dollars) 4/	.0678	.1134

1/ Based on 15-stop trip, round trip of 150 feet between truck and store, and $6.00 per hour for driver.
2/ Additional time required to total amounts on order sheet.
3/ Additional time required to straighten display case.
4/ Based on 300-package truckload.

Table 3 shows a comparison of the two systems at the ice cream plant and at the retail outlets. Comparable labor costs were $23.94 or 7.98 cents per package for the call-in system and $37.20 or 12.40 cents per package for the driver-salesman system.

Table 3.--Labor costs for the 2 delivery systems 1/

Cost component	Call-in system	Driver-salesman system
	----------Dollars----------	
Cost at plant 2/	3.60	3.18
Cost at delivery stop 3/	20.34	34.02
Total cost	23.94	37.20
Cost per package	.0798	.1240

1/ Based on 15-stop trip and 300-package truckload.
2/ From table 1.
3/ From table 2.

DISCUSSION

Labor costs per package were 7.98 cents for the call-in system and 12.40 for the driver-salesman system, or a difference of 4.42 cents per package. Under the call-in system, the labor savings for a 300-package truckload would be $13.26.

The higher cost for the driver-salesman system comes from the extra time spent at each delivery stop. The driver-salesman spent 5.67 man-hours at retail outlets compared with 3.39 man-hours for the call-in driver, a difference of 2.28 man-hours. During the study it was observed that 13 percent, or 1.95 stops, of the driver-salesman's deliveries were "no-sales." He spent 0.31 man-hour at these "no-sale" stops (0.16 man-hour X 1.95 stops).

The "extra time" (2.28 man-hours) and the "no-sale time" (0.31 man-hour) required for the driver-salesman means that a total of 2.59 man-hours could have been used for other revenue-producing activities. In other words, a driver-salesman can deliver 300 packages in 15 stops in 5.67 man-hours. A call-in driver can deliver 300 packages in 15 stops in 3.39 man-hours. Therefore, theoretically, in 5.67 man-hours, a call-in driver could deliver 502 packages. With some companies, this increase in productivity could result in a need for fewer delivery trucks.

But, each system has advantages and disadvantages in its particular type of delivery.

The advantages of the driver-salesman delivery system are:

- Company employees are not needed to make or receive telephone calls to write customer orders.
- Retailers will not have to be trained to determine their product needs or have to spend time rotating merchandise.

° Since the truck is not loaded by customer orders, the driver can carry additional items that the retailer may request at time of delivery.

° Driver may be able to sell more ice cream per stop. The more he sells, the more he earns.

Disadvantages of the driver-salesman system are:

° Driver must spend time at each stop to determine retailer needs.

° Driver must drive to a delivery stop in order to determine if a customer needs any items. In 13 percent of the stops there were "no sales."

° If a retailer decides that he needs particular items when the driver arrives, those items may not have been included in the load.

Advantages of the call-in delivery system are:

° Products in truck are handled less, which gives better quality control.

° Driver spends less time at a delivery stop. Order sheets for each stop have already been prepared, and the driver does not have to determine retailer needs.

° Driver will not go to a retailer where there will be a "no sale."

° Driver does not have to use time determining and writing orders for the next-day delivery.

° Since driver spends less time at each stop, he can service more retailers in an 8-hour workday.

° Order deliveries are more accurate.

Disadvantages of the call-in system are:

° Employees must be trained to answer or make telephone calls and prepare order sheets.

° Retailers usually cannot add to their order at time of delivery.

° Retail customers must have some training in inventory control and predicting sales.

° Retailers may not call in their orders on time, or plant personnel may not be able to reach customers by telephone to obtain their orders.

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